ATTACHMENT 15

TRAFFIC IMPACT ANALYSIS
SUMMARY

FOR THE

HOMESTEAD COMMUNITY PARK AQUATIC CENTER

Prepared For
Town of Chapel Hill
Chapel Hill, North Carolina

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TRAFFIC IMPACT ANALYSIS
HOMESTEAD COMMUNITY PARK AQUATIC CENTER
CHAPEL HILL, NORTH CAROLINA

A. SUMMARY

This document summarizes the results of the Traffic Impact Analysis (TIA) Report performed for the Homestead Community Park Aquatic Center in Chapel Hill, North Carolina.

1. Project Overview

The purpose of this study is to determine the potential impact on the surrounding transportation system created by traffic generated by the proposed development as well as recommend improvements to mitigate the impacts. In order to accomplish this objective, this study analyzes existing (2004) traffic conditions, future (2006) traffic conditions without the proposed development but including adjacent development traffic, and future (2006) traffic conditions with the proposed development during the weekday AM, mid-day and PM peak hours.

2. Study Area

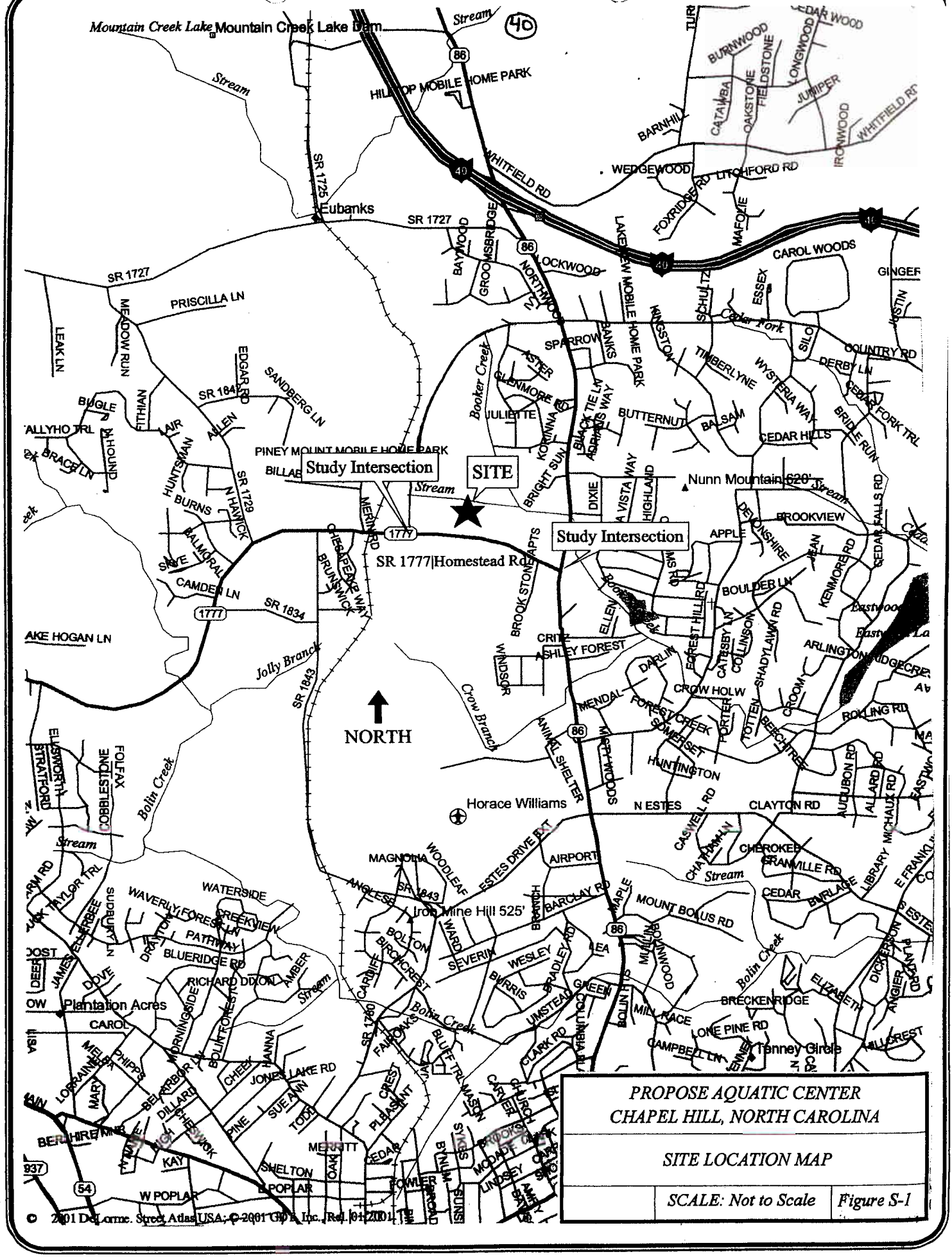
The proposed development is located in the northwest portion of Homestead Park on the east side of Homestead Park Drive to the north of Homestead Road in Chapel Hill, North Carolina. Refer to Figure S-1 for the site location map. The scope of this project was developed through coordination with the Town of Chapel Hill and consists of the following intersections:

1) Homestead Road and Weaver Dairy Road Extension (unsignalized)
2) Homestead Road and Homestead Park Drive/Apartment Driveway (unsignalized)
3) Homestead Road and Airport Road (signalized)

3. Site Traffic Generation

The Homestead Community Park Aquatic Center will consist of a 28,257 s.f. aquatics center, including two pools, locker rooms, and limited office space for staff. Refer to Figure S-2 for the site land use plan.

Average weekday daily, AM peak hour, mid-day peak hour, and PM peak hour trips for the proposed development were calculated utilizing methodology contained within the ITE *Trip Generation* Manual, 7th Edition. However, the ITE *Trip Generation* Manual does not contain trip generation information for an aquatics center land use. Therefore, several similar land uses were considered, including a Health/Fitness Club, a Multipurpose Recreational Facility, an Athletic Club, and a Recreational Community Center. Engineering judgment was used to determine that the trip generation of a Health/Fitness Club would most accurately represent the trip generation of the proposed aquatics center. Refer to Table S-1 for the trip generation results of the proposed development.



PROPOSE AQUATIC CENTER CHAPEL HILL, NORTH CAROLINA	
SITE LOCATION MAP	
SCALE: Not to Scale	Figure S-1

TABLE S-1
TRIP GENERATION

ITE Land Use (Code)	Density	Daily Trips (vpd)	AM Peak Hour (vph)		Mid-day Peak Hour (vph)		PM Peak Hour (vph)	
			Enter	Exit	Enter	Exit	Enter	Exit
Health/Fitness Club (492) for Aquatic Center	28,257 square feet	932	14	20	58	56	58	56

4. Access Analysis

Access to the site will be provided via existing Homestead Park Drive. Homestead Park Drive is a two-lane roadway with a posted speed limit of 25 mph. Homestead Park Drive is expected to provide adequate access for this development. Left and right turn lanes are currently provided on Homestead Road for traffic turning onto Homestead Park Drive. Refer to Figure S-2 for an illustration of the land use and access plan.

5. Intersection Analysis

A signal warrant analysis was conducted for the intersection of Homestead Park Drive and Homestead Road based on future (2006) peak hour traffic volumes including adjacent development and proposed development traffic. The signal warrant analysis report is included in Appendix F. The signal warrant analysis results indicate the peak hour signal warrant (Warrant 3A) would be met due to PM peak hour traffic. Since trip generation data was not available for an aquatics center and the schedule for the aquatics center, including practices and swim meets, may not occur during the peak hour of adjacent street traffic, it is recommended to conduct traffic counts after the proposed development is open to evaluate the need for a traffic signal.

Crash data were provided by the NCDOT for the segment of Homestead Road from Airport Road to Seawell School Road including crash data at the intersections with Airport Road and Homestead Park Drive. Crash data was compiled between May 1, 2002 and April 30, 2004, which is the most recent three years of available data. Table S-2 presents a summary of the crash data and comparison to statewide averages for a similar type of facility.

Table S-2
Crash Analysis Summary

Crash Type	# of Crashes	Crashes per 100 MVM Traveled	Statewide Rate[1]	Critical Rate[2]
Total	24	193.45	422.44	522.46
Fatal	0	0	1.18	10.28
Non-Fatal Injury	11	88.66	142.04	201.73
Night	2	16.12	94.47	143.89
Wet	5	40.30	69.02	111.85

As indicated in the crash analysis report, 24 crashes occurred over a three-year period on Homestead Road in the study area. It should be noted that this analysis does not include crashes that occurred along Airport Road upstream or downstream of Homestead Road. Ten crashes occurred at the intersection with Seawell School Road, which is not in the study area and 8 crashes occurred at Airport Road. Sixteen crashes were rear-end type crashes, which are typically the most common type of crash at signalized intersections. This segment of roadway is lower than the statewide rates for similar facilities. Further, an analysis of the crash data does not indicate a significant safety exists on Homestead Road in the study area.

6. Peak Hour Intersection Levels of Service

This study included three (3) separate analysis scenarios; existing (2004) traffic conditions, future (2006) traffic conditions without the proposed development but including adjacent development traffic, and future (2006) traffic conditions with the proposed development during the weekday AM, mid-day and PM peak hours. Based on information provided by the Town of Chapel Hill, several adjacent developments will impact the study intersections. All traffic generated by these adjacent developments were included in the future (2006) traffic conditions. Refer to Table S-3 for peak hour analysis results for existing (2004) traffic conditions, future (2006) traffic conditions without the proposed development, and future (2006) traffic conditions with the proposed development.

Analysis indicates the intersection of Airport Road and Homestead Road will operate at LOS C in the AM and mid-day peak hours and LOS E in the PM peak hour without improvements. The northbound left turn and eastbound right turn movements are expected to operate at LOS E or F in the PM peak hour. Calculated 95th percentile northbound left turn queues are expected to exceed 560 feet per left turn lane, while the eastbound and southbound right queues are expected to exceed 600 feet. The intersection of Airport Road and Homestead Road was analyzed with a right turn overlap phase for the eastbound and southbound right turn movements along with modified signal timings. With these improvements, the intersection is expected to operate at an overall LOS C in the AM, mid-day, and PM peak hours. Queues on the northbound left turn, eastbound right turn, and southbound right turn are significantly reduced. The reduced phase split for the westbound movements may not allow pedestrians to cross the intersection during this phase. It is not anticipated that the timing adjustments would significantly affect operations of the signal system; however, an analysis was not completed to determine the extent of impact of the revised timings.

Without improvements, the minor street approach of Weaver Dairy Road Extension at the intersection with Homestead Road will operate at LOS F in the AM and PM peak hours. With auxiliary turn lanes on Homestead Road and separate turn lanes on Weaver Dairy Road Extension, the minor approach will continue to operate at LOS F; however, the delays are reduced.

Table S-3
Level-of-Service Summary

INTERSECTION		2004 Existing			2006 Future + Adjacent Development Without Proposed Development			2006 Future With Site		
		AM	MID-DAY	PM	AM	MID-DAY	PM	AM	MID-DAY	PM
Homestead Road and Weaver Dairy Rd. Ext. (Unsignalized)	EB	A^1	A^1	A^1	A^1 A^{1*}	A^1 A^{1*}	A^1 B^{1*}	A^1 A^{1*}	A^1 A^{1*}	A^1 B^{1*}
	WB	--	--	--	--	--	--	--	--	--
	SB	C^2	B^2	D^2	F^2	B^2	F^2	F^2	B^2	F^2
Homestead Road and Homestead Park Drive/Apartment Drive (Unsignalized)	EB	A^2	A^2	A^2	A^2	A^2	B^2	A^2	A^2	B^2
	WB	A^2	A^2	A^2	A^2	A^2	A^2	A^2	A^2	A^2
	NB	C^1	B^1	B^1	C^1	B^1	C^1	C^1	B^1	C^1
	SB	B^1	B^1	D^1	C^1	B^1	E^1	C^1	C^1	F^1
Homestead Road and Airport Road (Signalized)	EB	D	E	E	D D*	E E*	E E*	D D*	E E*	E D*
	WB	D	E	E	D D*	E E*	E E*	D D*	E E*	E E*
	NB	B	B	D	B B*	C C*	E E*	B B*	C C*	F C*
	SB	C	B	C	D B*	B B*	C B*	D B*	C B*	C C*
	Overall	**C**	**C**	**D**	**C C***	**C C***	**E D***	**C C***	**C C***	**E C***

* Analysis results with intersection improvements

1. Level of service for left turn movement on major approach.
2. Level of service for minor approach.

Homestead Park Drive at the intersection with Homestead Road is expected to experience delays in the PM peak hour. Since left and right turning vehicles on Homestead Park Drive are separated, no further improvements are expected to significantly improve the levels of service on the minor street approaches.

7. Pedestrian and Bicycle Analysis

Sections of sidewalk exist on the east side of Weaver Dairy Road Extension and Homestead Park Drive, the north and south sides of Homestead Road, and the east and west sides of Airport Road. No additional sidewalks are recommended as a result of this project.

Currently, bicycle lanes exist on the east and west sides of Airport Road to the north of Homestead Road. No additional bicycle lanes are recommended as a result of this project.

8. Public Transportation Analysis

Based on information obtained during field reconnaissance by RKA, there are multiple bus stops located within the study area. Specifically, two bus stops are located along Homestead Road (one on the north side and one on the south side) and two bus stops are located along Airport Road (one on the east side and one on the west side) near the intersection of Homestead Road and Airport Road. Based on information received from the Town of Chapel Hill, the A Route, T Route, and N/S Express Route access one or more of these bus stops.

9. Special Analysis/Issues

A long-term link analysis was conducted on Homestead Road for the year 2025. Based on NCDOT ADT data, Homestead Road carried approximately 11,000 vehicles per day (vpd) in 2003. To determine the future ADT volume on Homestead Road, the 2003 ADT was projected to the year 2025 using a 2% compound annual growth rate. The projected 2025 ADT volume on Homestead Road in the vicinity of the site is anticipated to be approximately 17,000 vpd. Based on this estimate, it is anticipated that additional through lanes would be necessary on Homestead Road to accommodate the daily traffic volume. The proposed development would generate approximately 900 trips per day in addition to the future ADT. Approximately 80% of the trips will utilize Homestead Road east of Homestead Park Drive, while 20% will travel to/from the west on Homestead Road.

10. Mitigation Measures/Recommendations

Based on the findings of this study, the following improvements are recommended at study intersections to achieve a desirable level of operation. These improvements are recommended regardless of whether the proposed development is built. Refer to Figure S-3 for an illustration of improvements.

<u>Intersection of Homestead Road and Weaver Dairy Road</u>

- Provide an exclusive right turn lane on the westbound approach of Homestead Road with a full-width storage of 100 feet and a 100 foot taper.

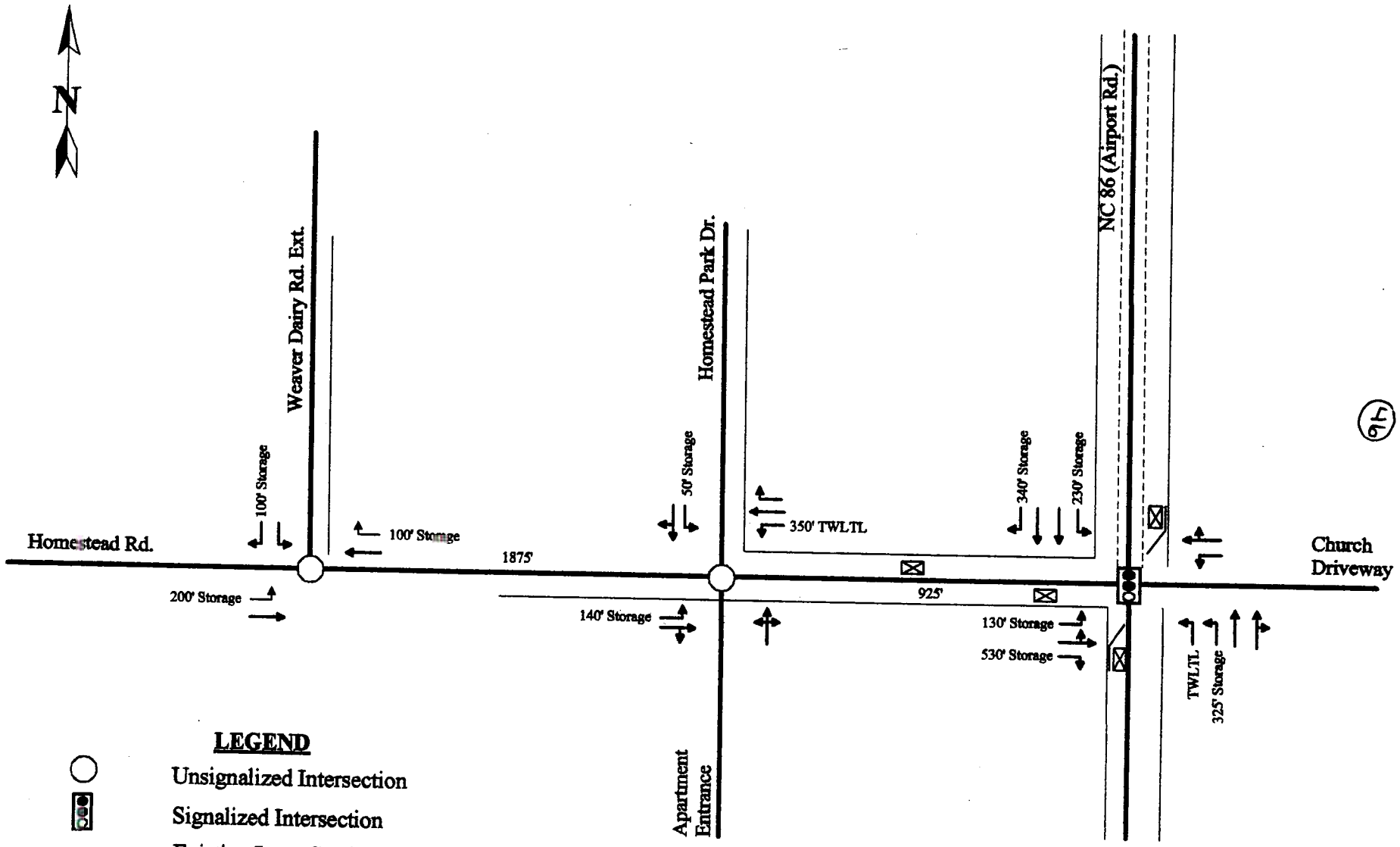
- Provide an exclusive left turn lane on the eastbound approach of Homestead Road with a full-width storage of 200 feet and a 100 foot taper.

Intersection of Homestead Road and Airport Road

- Provide an overlap phase for the southbound and eastbound right turn movements. This improvement will require modifications to the existing traffic signal design at this intersection. Signal timing adjustments at this intersection are also recommended for the PM peak hour signal system plans.

Intersection of Homestead Road and Homestead Park Drive

- If the installation of a traffic signal is considered at this intersection, it is recommended to conduct traffic counts when the proposed development is operational for an accurate representation of the aquatic center traffic.



PROPOSED AQUATICS CENTER
CHAPEL HILL, NORTH CAROLINA

RECOMMENDED LANE CONFIGURATIONS

SCALE: Not to Scale | *Figure S-3*